

SHOWCASE PROJECT: CITY OF MANKATO: ORNESS PLAZA

SOLUTION OVERVIEW

The Orness Plaza is a 7-story, 101-unit apartment building located in Mankato, Minnesota. Originally constructed in 1971, it is primarily home to an elderly and disabled population. The 98 one-bedroom and 3 two-bedroom units are arranged around an open atrium. Planning for a substantial renovation of the aging and poorly performing 40 year old building began in 2009 with the goals of improving occupant health, building durability, and the energy and water efficiency of the buildings systems.

The building, constructed in 1971, was in poor condition prior to the renovation. The primary structure and enclosure was a site-poured concrete frame with exposed concrete aggregate panels, which had developed hairline cracks over time, resulting in staining and spalling on the exterior. The original windows (aluminum single-pane sliders) failed almost immediately after construction, frequently leaking. The existing heating and cooling system was a hydronic system fed by a central natural gas-fired boiler and individual through-wall air conditioners. The building had an exhaust-only ventilation strategy and no mechanical fresh-air ventilation in the units. The poorly performing systems and structures were grossly inefficient, original to the building, and needed to be updated.

SECTOR TYPE

Multifamily

LOCATION

Mankato, Minnesota

PROJECT SIZE

66,000 Square Feet

SOLUTIONS

A green charrette was held to kick-off the Orness project. The building ownership development team worked with an integrated design and construction team consisting of architects, engineers, commissioning agents, and researchers in building science and public health. The team explored various strategies and identified primary goals to extend the useful life of the building, focus on health living environments for the residents, improve indoor environmental quality (IEQ), and reduce energy and water consumption. A holistic approach was utilized to understand and integrate solutions in the project.

The scope of work included the following energy and water efficiency measures:

- Upgrading the building shell with an exterior insulation and finishing system (EIFS) and metal panel assembly; the new wall system has an R-value of 16 and provides continuous insulation
- Installing new windows with an average u-factor of 0.299 and a solar heat gain coefficient of 0.239
- Introducing mechanical fresh-air ventilation that is de-coupled from heating and cooling to provide more reliable distribution into each unit. The fresh air is supplied from 12 energy efficient rooftop units
- Installing a new HVAC system with a central geothermal ground source heat pump; the system feeds a water loop connected to individual heat pumps in each unit
- Using pressure-reducing valves and supplying hot water through gas-fired commercial grade hot water heaters

Additional measures include:

- Stabilizing and restoring the primary concrete structure
- Abating asbestos tiles and mold
- Completing a unit-by-unit gut retrofit including full kitchen and bath

OTHER BENEFITS

The project received a LEED® Silver certification for new construction from the U.S. Green Building Council and fulfilled the Enterprise Green Communities Criteria with Minnesota Overlay.

The Orness Apartments is also the site of the GREAT (Green Rehabilitation of Elder Apartment Treatments) Study, which is examining the impact of green renovation on resident health. Research partners include the National Center for Healthy Housing, Mankato EDA, Southwest Minnesota Housing Partnership, and the Center for Sustainable Building Research. The project is funded by U.S. Department of Housing and Urban Development, Blue Cross Blue Shield Foundation of Minnesota, and The McKnight Foundation. To read more about the health study, view EDA Mankato's published [Implementation Model](#).

Annual Energy Use

Baseline(2008)

196 kBtu/sf/yr

Actual(2012)

147 kBtu/sf/yr

Energy Savings
25%

Annual Energy Cost

Baseline(2008)

\$97,000

Actual(2012)

\$72,000

Cost Savings
\$25,000



Orness Plaza Interior



Orness Plaza Exterior



EDA Mankato Housing Coordinator, Patti Ziegler, with former Vice President Walter Mondale, at the rededication of Orness Plaza in 2012. Mondale dedicated the building in 1972 when he was a Senator from Minnesota.